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Terminology Report from the International Continence Society (ICS) Working Group on Underactive Bladder (UAB)

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Keywords: Standardisation; Terminology; Lower Urinary Tract Function; International Continence Society.

INTRODUCTION

This report presents definitions of the symptoms, signs, urodynamic observations and conditions associated with detrusor underactivity (DU) and the potentially associated lower urinary tract symptom complex of the underactive bladder (UAB), relating to DU in all patients groups from children to the elderly. It is important to emphasise that in the past the use of the term UAB has been used in an non standardised and imprecise fashion.

Detrusor underactivity (DUA) may be an aspect of (or contributor to) lower urinary tract symptoms (LUTS), especially in later life. While DU is a urodynamic definition describing the detrusor voiding contraction, the clinical component of the definition – reduced urinary flow rate and/or an increased post-void residual (PVR) – have often and imprecisely been described as “underactive bladder” (UAB) [1,2]. In contrast to overactive bladder (OAB) and detrusor overactivity (DO), UAB and DU have remained largely unrecognized and poorly researched [1,2]. There is a paucity of data regarding the pathogenesis and treatment of DU, and the definitions of DU and UAB remain imprecise, with a variety of definitions and diagnostic criteria found within contemporary literature [1,2]. This lack of uniformity creates difficulties in characterizing UAB, in researching its effect on patient quality of life, and in evaluating possible treatments.

The symptoms associated with UAB are common [3] and likely to impact on quality of life [4]. In the absence of a specific consensus-based definition of UAB, the true burden cannot be fully appreciated, nor can appropriately robust clinical trials be conducted [1-4]. In this report, we discuss a new definition for UAB that could be used as a platform for future discussion and research.

Although DU is an increasingly recognised urodynamic observation contributing to LUTS in both men and women, there has been a lack of research into all aspects of this dysfunction, and as yet, no effective treatments exist. DU can be diagnosed only on the basis of an invasive urodynamic study. An international consensus group met at the International Consultation on Incontinence-Research Society (ICI-RS) and International Continence Society (ICS) annual meetings in 2014 and again at these meetings in 2015 to consider the feasibility of developing a working definition of a symptom complex associated with DU. Drawing an analogy to detrusor overactivity (urodynamic observation) and overactive bladder (clinical diagnosis based on a symptom complex), the aim of this document is to help identify affected patients of all ages and to facilitate further clinical and epidemiological research.

METHODS

The definitions restate or update those presented in previous International Continence Society Standardisation of Terminology reports [5-13].

As far as possible, the definitions are descriptive of observations, without implying underlying assumptions that may later prove to be incorrect or incomplete. By following this principle, the ICS aims to facilitate comparison of results and enable effective communication by investigators who use urodynamic methods.

This document was developed according to the published methodology of the ICS Standardization Steering Committee [5]. The group commissioned for this report developed an outline of proposed content and revised this in the light of a workshop held at the 4th International Neuro-Urology Meeting in Zurich, Switzerland in August 2015. The subsequent text was reviewed by the working group before a final draft was discussed at a workshop during the ICS meeting in Montreal in October 2015.

DEFINITIONS

LUTS are defined from the individual's perspective who is usually, but not necessarily, a patient within the healthcare system. Symptoms are either volunteered by, or elicited from, the individual or may be described by the individual's caregiver.

LUTS are divided into three groups: storage, voiding, and post micturition symptoms.

LUTS are not disease specific. The symptoms of hesitancy, straining to void and a slow urinary stream can be characteristic of both bladder outflow obstruction (BOO) and detrusor underactivity (DU).

Storage Symptoms are experienced during the storage phase of the micturition cycle.

- ***Increased daytime frequency*** is the complaint by the patient who considers that he/she voids too often by day.
- ***Nocturia*** is the complaint that the individual has to wake at night one or more times to void.
- ***Urgency*** is the complaint of a sudden compelling desire to pass urine which is difficult to defer.

Voiding Symptoms are experienced during the voiding phase. Since UAB is a disorder of emptying these seem to be the predominant ones but voiding symptoms may also be associated with storage symptoms in case of incomplete bladder emptying.

- ***Slow stream*** is reported by the individual as his or her perception of reduced urine flow, usually compared to previous performance or in comparison to others. .
- ***Intermittent stream (intermittency)*** is the term used when the individual describes urine flow which stops and starts, on one or more occasions, during micturition.

- **Hesitancy** is the term used when an individual describes difficulty in initiating micturition resulting in a delay in the onset of voiding after the individual is ready to pass urine.
- **Straining** to void describes the muscular effort used to either initiate, maintain or improve the urinary stream. **FOOTNOTE 7**
- **Feeling of incomplete bladder emptying of the bladder** during voiding
- **Terminal dribble** is the term used when an individual describes a prolonged final part of micturition, when the flow has slowed to a trickle/dribble.

Post Micturition Symptoms are experienced immediately after micturition.

- **Feeling of incomplete emptying** is a self-explanatory term for a feeling experienced by the individual after passing urine.
- **Post micturition dribble** is the term used when an individual describes the involuntary loss of urine immediately after he or she has finished passing urine, usually after leaving the toilet in men, or after rising from the toilet in women.

Symptom Syndromes Suggestive of Lower Urinary Tract Dysfunction

In clinical practice, empirical diagnoses are often used as the basis for initial management after assessing the individual's lower urinary tract symptoms, physical findings and the results of urinalysis and other indicated investigations.

- **Urgency**, with or without urgency incontinence, usually with frequency and nocturia, can be described as the **overactive bladder syndrome**, **urge syndrome** or **urgency-frequency syndrome**.

These symptom combinations are suggestive of urodynamically demonstrable detrusor overactivity but can be due to other forms of urethro-vesical dysfunction. These terms can be used if there is no proven infection or other obvious pathology.

- **Lower urinary tract symptoms suggestive of bladder outlet obstruction** is a term used when a man complains predominately of voiding symptoms in the absence of infection or obvious pathology other than possible causes of outlet obstruction
- **Underactive bladder** is characterised by a slow urinary stream, hesitancy and straining to void*, with or without a feeling of incomplete bladder emptying sometimes with storage symptoms**. (NEW)

* **FOOTNOTE a** Underactive bladder occurs in association with diverse pathophysiologies and based on current knowledge there is no single distinguishing symptom.

** **FOOTNOTE b** Storage symptoms are varied and may be highly prevalent, including nocturia, increased daytime frequency, reduced sensation of filling and incontinence. Underlying mechanisms of storage symptoms are diverse, and are often related to a significant post voiding residual urine volume.

- **Lower urinary tract symptoms suggestive of bladder outlet obstruction** is a term used when a man complains predominately of voiding symptoms in the absence of infection or obvious pathology other than possible causes of outlet obstruction***.

*** **FOOTNOTE c** In women voiding symptoms are usually less likely to be caused by anatomical bladder outlet obstruction, therefore, detrusor underactivity and functional causes of outlet dysfunction are more likely (such as dysfunctional voiding).

URODYNAMIC OBSERVATIONS AND CONDITIONS

In the context of urodynamics we would affirm the ICS standardisation report definitions:-

Detrusor function during voiding

- **Normal detrusor function**
Normal voiding is achieved by a voluntarily initiated continuous detrusor contraction that leads to complete bladder emptying within a normal time span, and in the absence of BOO. For a given detrusor contraction, the magnitude of the recorded pressure rise will depend on the degree of outlet resistance.
- **Abnormal detrusor activity** can be subdivided:
 - **Detrusor underactivity** is defined as a contraction of reduced strength and/or duration, resulting in prolonged bladder emptying and/or a failure to achieve complete bladder emptying within a normal time span****.
 - **Acontractile detrusor** is one that cannot be demonstrated to contract during urodynamic studies. -

**** **FOOTNOTE d** A urodynamic study is essential to differentiate between Bladder outlet Obstruction and Detrusor Underactivity. A normal detrusor contraction will be recorded as: high pressure if there is high outlet resistance, normal pressure if there is normal outlet resistance or low pressure if urethral resistance is low.

- **Post void residual (PVR)** is defined as the volume of urine left in the bladder at the end of micturition*****.

***** **FOOTNOTE e** *If after repeated free uroflowmetry no residual urine is demonstrated, then the finding of residual urine during urodynamic studies should be considered an artefact, due to the circumstances of the test.*

Abnormal detrusor activity in the voiding phase does not exclude the presence of **detrusor overactivity** in the storage phase. This may then be described as, for example, storage phase detrusor overactivity combined with voiding phase detrusor underactivity.

CONCLUSIONS

DU is diagnosed urodynamically and has a pressure/flow-based ICS definition, however, it is not feasible to utilise urodynamics outside a secondary care centre. DU is characterized by an absent or low-pressure, and/or poorly-sustained detrusor contraction in combination with low urinary flow. In contrast, UAB has no ICS definition but we would propose UAB as the clinical syndrome that accompanies DU. Because UAB is largely undefined in the literature, there is, in our view, the need for a new symptomatic definition.

For the sake of symptom quantification in much-needed research moving forward, it appears that a crystallized definition of UAB would be of definite value. In properly defining UAB, it will be important to consider the entire symptom complex, describing the sensation of incomplete or impaired voiding that may include hesitancy, straining to void, incomplete bladder emptying, slow or prolonged stream, or intermittent stream, without implying any specific urodynamic/functional findings or causative physiology.

Properly defined, UAB could be to DU as OAB is to DO, where treatment according to a symptom-based diagnosis would be possible if the diagnosis was sufficiently robust. Patient choice, practical, and cost reasons often necessitate treatment without a pressure/flow-based diagnosis

We propose that this definition should now be tested to check its validity. In particular the factors to be considered are the influence of gender, age, and origin (neurogenic versus non-neurogenic), combining the interpretation of symptoms along with bladder diaries, flow rates, PVR volumes, and urodynamic data. It is hoped that this suggested definition may be used as a springboard for future UAB research and discussion, in terms of both qualitative research to look for characteristic symptoms, and quantitative research in urodynamically-defined DU patients.

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